



**ABSTRACT OF THE DISCLOSURE**

A machine-implemented method is provided for placing a plurality of particles to create a simulated particle pack. The method comprises defining a central string, a space disposed about the central string, and N concentric subspaces disposed about the central string and within the space, each of the N subspaces corresponding to one of the N particle categories, selecting a particle from the plurality of particles, and placing the selected particle in the corresponding subspace so that the selected particle becomes a placed particle at a particle location unique to that placed particle and is in non-overlapping relation with other placed particles. The selected particle placement includes defining a catch net representative of buoyancy of a portion of the placed particles and positioning the catch net within the space based upon the placement of the portion of the placed particles. The selected particle placement further includes defining a water level representative of a level of a portion of the placed particles that are smaller than the selected particle and represent a surface of the smaller placed particles. The selected particle is placed in non-overlapping relation with respect to the catch net and the water level. The method further includes positioning the water level within the space based upon the smaller particle surface. The particle selection and placement procedures are repeated until a desired number of particles have been placed. Related apparatus also are disclosed.